



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/651,648	08/29/2003	Juan Manuel Teijido	450117-04466	9331
7590 01/27/2005				
FROMMER LAWRENCE & HAUG LLP 745 FIFTH AVENUE NEW YORK, NY 10151			EXAMINER CHANG, AUDREY Y	
			ART UNIT 2872	PAPER NUMBER

DATE MAILED: 01/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary

Application No.

10/651,648

Applicant(s)

TEIJIDO ET AL.

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s).

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on November 19, 2004, which has been entered into the file.
- By this amendment, the applicant has amended claims 1-17 and has canceled claims 18-19.
- Claims 1-17 remain pending in this application.
- The rejections to claims 1-19 under 35 USC 112, first paragraph, set forth in the previous Office Action are **withdrawn** in response to applicant's amendment.
- The rejections to claims 1-17 under 35 USC 112, second paragraph, set forth in the previous Office Action are **withdrawn** in response to applicant's amendment.

Drawings

1. The drawings were received on November 19, 2004. These drawings are **accepted**.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **amended** claim 1 concerning "diffractive grating structure (31), and the **amended** claim 11, concerning "said convex protrusions, said concave recesses **and** said embedded portions" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief

Art Unit: 2872

description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Response to Amendment

3. The amendment filed on November 19, 2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: **claim 5 has been amended** to include the phrase "light selecting element is capable of reflecting **and** transmitting s-polarized components of incident primary illumination light and transmitting **and** reflecting p-polarized components of incident primary illuminating light". The specification only teaches that the light selecting element to **either** reflecting **or** transmitting s-polarized light and **either** transmitting **or** reflecting p-polarized light. The light selecting element **cannot** reflect **and** transmit s-polarized light at the same time and cannot reflect and transmit p-polarized light at the same time. What does it mean by reflecting and transmitting the **same** component of light at the same time??

Claim 6 has been amended to include the phrase "light selecting element is capable of reflecting **and** transmitting said predefined spectral components or colors of incident primary illumination light and of transmitting **and** reflecting complements of said predefined spectral components or colors of said incident illumination light". It is **impossible** for the light selecting element or any other optical element to transmit **and** reflect the same spectral component or color of the light **at the same time**.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 5 and 6 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The reasons for rejection based on the newly added matters are set forth in the paragraphs above. These newly added features also are not enabled by the disclosure of the specification as explained in the paragraphs above.

Claim Objections

6. **Claims 1-17 are objected to because of the following informalities:**

The claims are generally *narrative* and *indefinite*, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with **grammatical and idiomatic errors**.

(1). **Claim 1 has been amended** to include the phrase “for external use” however the phrase is confusing and indefinite since it is not clear “*external*” is defined with respect to what.

(2). **Claim 1 has been amended** to include the phrase “dichroic multiplayer structure” that is wrong. It should be “dichroic **multilayer** structure”.

(3). **The amended phrase** “dichroic spectral filter device” in claim 1 is wrong. The correct phrase should be “dichroic spectral filter device”.

(4). It is not clear how does the “dichroic spectral selection properties in reflection or transmission of ... light” recited in claim 2 relate to the **amended phrase** “adapted to act as a dichroic spectral filter device” recited in claim 1.

(5). The amended phrase “diffractive polarization properties in reflection and transmission of said primary illumination light” recited in claim 3 is confusing and indefinite since it is not clear what does this phrase really mean.

(6). It is not clear how does the phrase “adapted to act as a diffractive beam splitter device” recited in claim 7 relate to the **amended phrase** “adapted to act as dichroic spectral filter device” recited in claim amended claim 1.

(7). The applicant is respectfully reminded to also correct this mistake: “diffraction index” in the Specification, to either “refractive index” or “index of refraction”.

(8). **The amended phrase** concerning “said convex protrusions, said concave recesses **and** said embedded material portions” recited in claims 11-13 are confusing and indefinite since the specification fails to give a *positive structure disclosure* of the diffractive grating structure having the protrusions, the recesses **and** embedded material portions. It is therefore not clear what are these “embedded material portions” in relate to the diffractive grating structure. The phrase “said embedded materials” recited in claim 11 is confusing and indefinite since it lacks proper antecedent basis from its based claim.

(9). The phrase “is or is adapted to work as” recited in **claim 4**, the phrase “adapted to act as” recited in **amended claim 1** and various claims and “is or comprises a *plurality* of layers” recited in claim 14 are confusing and indefinite since it is not clear if the various element *is or is not* the various features recited follow the phrases.

The claims as stand now contain numerous errors, indefiniteness and confusions. The examiner can only point out a few. It is applicant's responsibility to clarify ALL of the discrepancies in the claims to make them in comply with the requirements of 35 USC 112.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1-2, and 4-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Kaise et al (PN. 6,330,112) in view of the US patent application publication by Takada et al (US 2002/0063962 A1, now US patent 6,822,796).**

Claim 1-2 and 4-17 have been significantly amended which therefore necessitate the new grounds of rejection.

Kaise et al teaches an *illumination unit* in an *image projection display apparatus* (Figure 1) wherein the illumination unit comprises a light source, serves as the *primary illumination light providing portion*, (11, Figure 1) that is adapted to provide a *primary illumination light* and a *projection lens* (70) serves as the *secondary illumination light providing portion* for providing a *secondary illumination light, for external use*, that is derived from the primary illumination light. Kaise et al teaches that a *polarization beam splitter* (17) and *dichroic mirrors* (66), **together** serves as the *light selecting element*, is disposed between the primary illumination light providing portion (11) and the second illumination light providing portion, (70) for *reflecting* S-polarization component of the incident light and for

Art Unit: 2872

transmitting the P-polarized component of the incident light and for *selecting* and separating *particular color* or *spectral* of incident light, (please see columns 5 and 10).

Claim 1 has been amended to include the feature having the light selecting element comprises a dichroic multilayer structure serves as a dichroic filter device and the dichroic multilayer structure is part of a diffractive grating structure. Kaise et al does not teach such explicitly. Takada et al in the same field of endeavor teaches a diffractive grating structure having a dichroic multilayer structure, (please see Figures 1-4), that is capable of *reflecting* light of a *selected* wavelength and *transmitting* light of the other wavelengths (i.e. having wavelength *selectivity* and *dichroic beam splitting and filtering function*), (please see paragraph [0009]). Takada et al further teaches that the *diffractive grating structure* with the *dichroic multilayer structure* also has *polarization selectivity*, namely the multilayer film is capable of *reflecting* s-polarized light and *transmitting* p-polarized light, (please see paragraph [0005] and [0009]). Takada et al teaches that the diffractive grating structure has a *grating bulk material* (11, Figures 1-3) and alternative sequence of *concave* areas and *convex* areas in the first surface of the bulk material and a *plurality of multilayer films* (13a and 13b), which serves as the *dichroic multilayer structure*, also with alternative sequence of concave areas and convex areas (12). In Figure 3, Takada et al teaches that the diffractive grating structure has line structure and the multilayer structure (12, Figure 3) serves as the *embedded* material that fill the concave areas of the grating bulk material. The refractive indices of the bulk material and the multilayer structure are different, (please see paragraph [0042]). With regard to claim 14, one can regard the multilayer structure as the grating bulk materials. It would then have been obvious to one skilled in the art to apply the teachings of Takada et al to modify the light selecting element, including both the polarization beam splitter and the dichroic mirrors of Kaise et al to make them into a *single* diffractive grating structure with dichroic multilayer structure for the benefit of using one single diffractive grating element to achieve both the wavelength selective and polarization selective property to reduce the size of the system.

With regard to claims 2, 4 and 6, Kaise teaches that the dichroic mirrors are designed that each dichroic mirror *reflects* one color component (either red, green or blue) and *transmits* other color components of the light, which therefore acts as a *dichroic beam splitter*. Takada et al teaches that the diffractive grating structure with the dichroic multilayer structure has wavelength selectivity namely reflecting light of one wavelength and transmits light of different wavelength, (please see paragraph [0009]). Claim 6 is incorrect for the reasons stated in rejection under 35 USC 112, first paragraph.

With regard to claim 5, Kaise et al teaches that the polarization beam splitter (17) reflects S-polarized light and transmits P-polarized light. Takada et al also teaches that the diffractive grating structure with dichroic multilayer structure is capable of reflecting s-polarized light and p-polarized light. Claim 5 however is wrong for the reasons of rejections stated under 35 USC 112, first paragraph.

With regard to claim 15, Kaise et al teaches that each of the dichroic mirrors are made of *multilayer films*, (please see column 5, lines 30-35) that serves as the *dichroic spectral filter and which implicitly has alternative layers of first and second materials*. Takada et al also teaches that the dichroic multilayer structure has alternative layers of first and second materials (13a and 13b, Figure 3). With regard to claim 16, it is implicitly true that the multilayer structure has a first and second layers extend essentially in plane of the incident surface. With regard to claim 17, Takada et al teaches explicitly that the at least part of the concave recesses and convex protrusions are formed in the dichroic multilayer structure.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Kaise et al in view of patent application publication by Takada et al as applied to claim 1 above, and further in view of Japanese Patent issued to Hamada (JP 406130224A).

The illumination unit taught by Kaise et al in combination with the teachings of Takada et al as described for claim 1 above has met all the limitations of the claims. Takada et al teaches that the

Art Unit: 2872

diffraction grating structure having dichroic multilayer structure is capable of selecting wavelength component as well as polarization component of light. However these references do not teach **explicitly** that the polarization selectivity is *diffraction* polarization selection properties. **Hamada** in the same field of endeavor teaches a polarization beam splitter having diffraction grating with optical multilayer film structure (2) that is capable of *diffraction* splitting the polarization component of light, (please see the abstract and Figures 1-4). It would then have been obvious to one skilled in the art that the cited **Hamada** reference either demonstrates that the diffraction grating structure of Takada et al *also* selects polarization component based on diffraction property or it would have been obvious to one skilled in the art to apply the teachings of Hamada to design the diffraction grating structure with dichroic multilayer structure to have *diffraction* polarization selectivity for the benefit of more accurately selecting different polarization component of the light, since it is well known in the art that optical selection property based on diffraction property has better selectivity efficiency due to the nature of diffraction theory.

Response to Arguments

10. Applicant's arguments with respect to **amended claims 1-17** have been considered but are moot in view of the new ground(s) of rejection. The newly amended claims have been fully considered and rejected for the reasons stated above.

11. In response to applicant's arguments which state that the cited Kaise et al reference does not teach the light selecting element is a single device or entity which therefore differs from the instant application the examiner respectfully disagrees for the reasons stated below. The applicant is respectfully noted that the features concerning "single device" or "single entity" are **not** recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Art Unit: 2872

12. In response to applicant's arguments which state that the cited Takada et al reference does not teach the diffractive element to have polarization selectivity, the examiner respectfully disagrees and asked the applicant to study paragraphs [0005] and [0009] of Takada et al reference which *specifically* teaches that the diffractive grating structure with dichroic multilayer structure has *polarization selectivity*.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

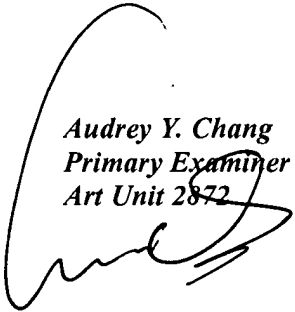
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.